Competitiveness and an Emerging Sector: The Russian Software Industry and its Global Linkages

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ABSTRACT

This paper analyzes the Russian software industry in the context of trade in information technology services. We assess Russia’s underlying sources of competitive edge in software, such as its scientific establishments, education system, diaspora and low costs, and identify the institutional impediments to growth. A survey reveals that foreign outsourcing contracts, a high value-added niche and high education levels characterize Russia’s small, privately held software firms. A comparison with the Indian software industry underscores the structural differences in outsourcing relationships developed by the two countries and emphasizes that national advantages are complex amalgamations of many factors and need to be overtly marketed. Beyond the resources that give comparative and competitive advantage to a transitioning economy, a critical role is played by powerful industry organizations and by non-market state institutions that can level the economic field and inject credibility into market structures.

KEY WORDS: Economic development, outsourcing, software, East Europe, Russia, comparative advantage, competitive advantage, India, education, high tech

I. Introduction

The globalization of the software industry has provided an opportunity for countries that are struggling to create jobs for their educated labor force. The need for this opportunity is particularly acute in Russia and other parts of the former Soviet Union, where the end of the cold war and the disintegration of the USSR displaced many highly trained scientists, engineers and technicians from their work in the scientific–research and military–industrial establishment.
The collapse of the Soviet Union, the dismantling of the planning structures that characterized its economic system and the market-oriented reform process gave rise to a host of economic problems. The autarchic system had previously encouraged the development of vast industrial conglomerates that had no need to compete on the world markets. Now, the simultaneous economic liberalization, privatization and globalization, as well as attendant political instability, resulted in sudden and massive deindustrialization and demilitarization. The impact was particularly acute in the military–industrial complex and in the state scientific and technical establishment. The continuing restructuring of the Russian economy, and intermittent economic crises have led to serious underemployment and underutilization of the nation’s research and scientific institutes and its technically educated labor force.1 Efforts at “military conversion” have had mixed success.2

The rapid growth of the international software industry in the 1990s and the increasing global integration of the Russian economy have offered a new set of opportunities for the available pool of Russian scientists, engineers and mathematicians. Yet Russia’s software industry has lagged far behind countries with smaller skilled labor pools (Ireland, Israel) or with a shorter history of technical expertise (India). India’s IT sector, for example, has grown from a mere $150 million in 1991–92 to $5.7 billion in 1999–2000, which includes over $4 billion in exports, mostly to the USA (Moitra, 2001; NASSCOM–McKinsey Report, 2002). The growth rate has been over 50 percent per annum, and revenue projections for 2008 are around $87 billion. At the same time the McKinsey Global Institute (1999) estimates that the Russian offshore programming industry employs 5,000–8,000 programmers and generates annual revenue of $60–$100 million, significantly smaller than its Indian counterpart. These differences exist despite some institutional and historic similarities, including the major role of the public sector and defense establishments, strong technical education and industrial structure, and a shared strategy of resorting to outsourcing from Western clients.

This raises a series of questions for policy makers and academics. Why has Russia only partially realized the potential of its educated labor force, despite following the received wisdom of orthodox economics of privatization and liberalization?3 Why has the Indian software industry been so much more competitive in world markets? What is the role of the state and of institutions in promoting the competitiveness of emerging sectors in transitioning economies? If standard comparative advantage is not enough, does a Porterian competitive advantage deliver the goods?

We address these questions by examining how global sourcing, comparative advantage and the institutional environment have influenced the development of this industry. As part of our methodology, we compare the genesis and growth of the Russian software industry to the well-established Indian software story, employing a SWOT framework4 to compare the differences in national competitive advantage in software in the two countries. We use this comparison to analyze the potential for and constraints to further expansion of the Russian software industry.

Section II of this paper presents a brief discussion of the theoretical and empirical basis for understanding the development of the software sector in transitioning economies. Later

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1 See Stephen Cohen (2000) for a description and analysis of the deindustrialization of Russia.
3 The advantage in natural resource endowment, such as oil, gas, minerals, etc. is being duly exploited to the hilt, but that’s a different story.
sections also touch on some theoretical aspects. Section III discusses the role of historical comparative advantage and that of the former Soviet scientific and military–industrial complex in fostering the software industry. In Section IV, we put software outsourcing more generally in the context of globalization, describing how both mature and emerging outsourcing activities fit into the global production of software and computer programming services. In Section V we focus on the Russian software industry, drawing from a survey of Russian firms and brief case examples.\footnote{Our focus is on software outsourcing firms, clustered primarily in three cities—Moscow, St Petersburg and Novosibirsk in Siberia.} We introduce a comparative analysis of the Russian and Indian software industries, modeled after SWOT categories, in Section VI. Section VII concludes the paper with a discussion of challenges faced by the Russian software industry and future prospects of global integration in the high-tech industry. We also discuss the limitations of some of the extant theory and some lessons for building competitiveness for emerging sectors.

II. Theoretical Context

We draw on several branches of economic and business theory, as well as empirical analysis to understand the Russian experience. These include theories of trade and specialization (comparative advantage), the more applied approach of Porterian competitive advantage, and theories which address various aspects of global firm location patterns, from product cycle theory to factors in agglomeration.

*Trade Theory and Specialization*

Economic characteristics at both the macro and micro level are likely to shape the development of an industry in the global context. At the macro level, according to the theory of international trade and specialization, countries do best when they focus on economic sectors where they have a comparative advantage, that is, in the production of those goods and services where their costs are lower relative to producers in other countries or where they have specialized skills or resources. The underlying source of this comparative advantage is the abundance of endowment of an economy with the factors that are employed to produce these goods.\footnote{See Caves et al. (1990) for a detailed exposition of comparative advantage and the Heckscher–Ohlin factor abundance framework. As we shall see later, comparative advantage per se is not enough for the development of a competitive industry.}

In addition, more open economies—those that participate actively in international trade and investment—are likely to see greater economic growth and higher productivity growth than those that operate in autarchic conditions. This occurs because openness fosters

\footnote{SWOT stands for strengths, weaknesses, opportunities and threats. The SWOT framework has been used extensively in business planning, and its overall effectiveness for that purpose has been brought into question. In this paper, we find the framework useful for highlighting the factors that differentiate the Indian from the Russian experience in development of the software industry. See Chae and Hill (1996), Hill and Westbrook (1997), and Collett (1998).}
competition, learning, technological upgrading and specialization, all of which promote economic growth. Theoretical and empirical work suggest, however, that in both developed and developing economies, the degree to which an economy benefits from openness is also dependent on broader institutional and regulatory factors. As we discuss the institutional context of Russia, we identify both positive institutional changes that have brought about opportunities and institutional constraints that have limited the growth of the software sector.

**Competitive Advantage**

In a ground-up approach starting at the level of firms and industries, Porter and his diamond model (Porter, 1990) suggest that competitive advantage is the outcome of four interlinked factors: (a) Firm Strategy, Structure and Rivalry, conducive to competition; (b) Healthy Demand Conditions emanating from savvy consumers; (c) Clustering of Industries, both upstream and downstream; and (d) Specialized Factor Conditions, embodied in skilled labor, capital and infrastructure. Porter, however, sees government’s role in economic development as a pusher, catalyst and challenger, rather than as being explicitly economic. The Porterian paradigm is dominated by the notion of competition, and every measure is geared toward that objective. Policies must encourage companies to raise their performance, stimulate early demand for advanced products, focus on specialized factor creation and to stimulate local rivalry by limiting direct cooperation and enforcing anti-trust regulations; firms/industries are therefore the fulcrum and not institutions.

**Location, Agglomeration and Life Cycle**

At the micro level, product cycle theory and theories of agglomeration all help to explain how firms spread their production activity globally. In product cycle theory, early stages of product development require location at the centers of innovation, while at later stages of the life cycle, when competition increases and the process has become routinized, production spreads to lower cost, often less specialized locations (Vernon, 1979). With the ease of communication provided by the Internet and the spread of corporations to multinational locations, proximity to headquarters is less important than it once was in the research and development process (Cantwell, 1995).

Agglomeration benefits for R&D and high-tech activity continue to be important. Case studies of Silicon Valley and more general empirical work on the location of R&D facilities show the tendency for these activities to cluster in centers with an educated and experienced labor force and strong educational institutions (Saxenian, 1994; Kyle, 2004). In addition to labor market access, the benefits accrue from knowledge spillovers and supplier networks. Moreover, a recent stream of research suggests that foreign direct investment (FDI) may in some cases be motivated by desire to access innovations in the host country (Lorenzen and Mahnke, 2002). Each of these factors plays a role in creating the conditions for development of the Russian software industry.

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7 See, for example, Rajan and Bird (2002) for a discussion of liberalizing services trade in Asia and Cameron.
III. Comparative Advantage and the Blackboard Rule

It used to be said that Soviet science and technology follow the “blackboard rule”, that is, any discipline which required just a blackboard and a chalk for its study, development and dissemination, reached great heights of accomplishment. However, any subject requiring continuous investment in innovative, cutting edge equipment, complex supply ties, flexible and dynamic management techniques, multilateral manufacturing and hardware coordination was destined for failure. The educational and technical requirements for the software industry, unlike those for hardware manufacturing, are compatible with Russia’s strong “blackboard” educational structure in an environment fraught with logistical barriers.

Several factors are relevant to Russia’s comparative advantage with regard to the software industry. Human capital, that is, specialized education, skills and training, is the most critical factor in this industry. Russia has both existing human capital, in the form of an underutilized technical labor force, and an infrastructure for reproducing skilled human capital, in its existing education system. In addition, Russia has an extensive network of technical and research institutes, which over the decades has nurtured scientific and technical talent and which now provides a unique infrastructure underlying partnerships with foreign firms.

Education System

The primary reason for the availability of a large pool of scientists, engineers and workers with a technical education was the emphasis placed by the former Soviet education system on the sciences. Both the school system and the higher education system were heavily slanted in favor of mathematics, physics, engineering and other technically oriented subjects. In addition to universal literacy and a good basic grounding in the sciences at the high-school level, the Russian university system annually produces over 218,000 science and engineering graduates, more than any other country except the USA (see Figure 1). It is

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also one of the leading producers of doctoral graduate degrees in the world, as shown in Figure 2. Although the collapse of the Soviet system caused a severe disruption in the funding of the education system and severely strained its finances, the institutional structure of education has shown remarkable tenacity. The fundamental soundness of the infrastructure and the value placed by Russians on educational attainment have guaranteed its survival, at least up to this point. It remains to be seen whether continued financial troubles and cutbacks erode this advantage.  

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Research Establishment

The imperatives of the cold war arms race and the belief in science and technology as a primary tool of economic development led the Soviet state to invest heavily in geographically concentrated, specialized, research institutes and centers, thus forming major scientific agglomerations in some urban centers. The apogee of this policy was the establishment of the science city of Akademgorodok in the 1950s and 1960s as a suburb of the established city of Novosibirsk in Siberia. With over 30 world-class research institutes in the sciences, Akademgorodok is one of the premier “technopoles” in the world.  

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The record of Akademgorodok has been mixed. The avowed objective of the establishment of this science city was to give an impetus to the development of synergy between pure research, application research, manufacturing and policy (i.e. academia, industry and government). However, the system of economic command and control in the former Soviet Union, with its reliance on administrative fiat, lack of feedback up the chain of

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9 On the other hand, the Indian education system, which is a patchwork quilt of private and faith-based schools, and mostly public but an increasing number of private institutions of higher learning, is plagued with issues of quality, funding and lack of teachers. Even today the Indian education system largely serves the Indian elite, and the inability of the Indian establishment to formulate a comprehensive education policy for the wider masses puts serious limitations on any sustainable policy of economic growth.  

10 See Castells and Hall (1994) for a discussion of technopoles.
command, absence of appropriate incentives and centralized bureaucracy, impeded the emergence of this synergy, and the necessary autonomous horizontal ties and networks were never created. Financial autonomy and the loosening of vertical ties have now allowed the research institutes to fend for themselves, raise funds from private sources and look for profitable opportunities by exploiting the in-house expertise.

**Scientists and Engineers: Endowment and Costs**

Demilitarization has led to the freeing up of considerable human and other resources, necessary for the development of the information technology sector. As pointed out by Cooper (1998) in the Stockholm International Peace Research Institute (SIPRI) yearbook, military expenditure fell from $257 billion in the former Soviet Union in 1987 to $24.1 billion in Russia in 1997, and as a proportion of GNP from 16.6 percent in 1987 to 3.8 percent in 1997. According to estimates by Kennaway (1998), the Soviet military–industrial complex probably employed about 12–16 million people, including over two-thirds of all qualified scientists and engineers, amounting to 2.7 million people in 1991. Kennaway adds that post-Soviet Russia inherited 60–80 percent of these resources, that is, 9–12 million workers employed in the military–industrial complex. With recent employment in the defense industry at around 2 million,\(^\text{11}\) this would imply that over 7 million people have been displaced from this sector. Given the sector’s technical and scientific nature, it can be reasonably assumed that a significant share of those workers would be technically qualified and highly educated.

In addition to the prodigious supply this is also a low-cost pool of technical labor relative to costs in the USA and Europe (see Table 1). Programmer costs in Russia are competitive with those in India and other parts of Asia, and are on the order of 10 percent of US programmer costs.

**Other Factors**

The presence of a large, educated diaspora in a technically advanced country has turned out to be advantageous for the immigrants’ country of origin. Considerable research has

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\(^{11}\) Statement by Prime Minister Kasyanov, in Pravda, 2002-07-06.
been done on the transnational ties fostered by networks of immigrants in the USA and the brain circulation they promote, with benefits accruing to the country of origin (see Saxenian, 1999, 2002). Others (see Gould, 1994; Rauch, 2001; Bardhan and Guhathakurta, 2004) have focused on the economic significance of the knowledge bank that immigrants constitute, and how the latter could be tapped for purposes of breaking into foreign markets. The Indian diaspora in the USA has played a critical role in the development of the Indian software industry, particularly in the 1990s (Saxenian, 2002). While Indian-born immigrants have doubled in this decade from approximately 500,000 in 1990 to over 1.6 million in 2000, the number of Russian-born immigrants is approximately in the 400,000 range (US Census Bureau), and as yet they have not played a similar role in the development of the software sector in Russia.\footnote{Perhaps this is due to the fact that the Russian diaspora in the USA is much more heterogeneous in terms of education and occupations than the Indian immigrants.}

In the early 1990s Israel experienced a continuous flow of immigration from countries of the former Soviet Union, primarily Russia. Most Russian immigrants had higher education levels relative to the average Israeli. For example, in 1996, 36.5 percent of the immigrant Russian labor force had some college education and 24.5 percent had basic college and beyond, compared to 21.4 and 18.5 percent for the resident Israelis (Gandal et al., 2000). As a means of absorbing this sudden and large influx of highly qualified personnel, the Israeli government started a Business and Technology Incubator program in 1991, when immigration from the former Soviet Union had reached its peak. These technological incubators gave fledgling entrepreneurs an opportunity to develop their innovative technological ideas and set up new businesses. Partly because of this program, Israel has become a major player in high-tech, particularly in computer-related fields and software. The close ties that bind the Israeli high-tech industry with the USA, and the large and significant presence of immigrant Russian programmers in Israel, can act as significant linkages for the Russian software industry. The kind of multilateral complex outsourcing seen in hardware manufacturing is evolving in the software industry as well, and Russian firms are in a good position to play a key role in it through their Israeli and US connections. For example, Sapiens International Corp. in Tel Aviv, hired Russian immigrants in 1999 to fulfill contracts with US firms for Y2K upgrades. The Russian immigrants were familiar with the older operating systems that were the basis of many US company databases, and were able to upgrade these systems for US customers (see Deck, 1999).

Russia’s improving telecommunications infrastructure also contributes to its competitive position vis-à-vis India, while its installed base of computers shows potential for a domestic software market as well. Russia has been an active participant in the telecommunications revolution, upgrading the older Soviet physical and telecommunications infrastructure. In 2002, Russia had 242 telephone mainlines per 1,000 persons, compared to 167 in China and 40 in India, two of its potential competitors in the computer outsourcing business. Russia’s installed base of computers grew to 89 per 1,000 in 2002, compared to 28 per 1,000 in China and only 7 per 1,000 in India (World Bank; WDI). (On the other hand, India has considerable bandwidth capacity, which is of greater importance for the outsourcing business.)
However, despite all the enumerated advantages, Russia’s share is well below its potential share of the global software market. The combination of a severe economic decline and an as yet functional education system have left Russia with 16 percent of the world’s scientists and engineers (nearly three times the number of India and nearly equal to those of China and Japan put together) but less than 1 percent of the global GDP. Russia’s opportunity to bridge this gap in the future comes from a superior endowment of human capital, a competitive cost structure, the existing academic and research institute infrastructure, growing technical resources, and opportunities to create linkages with global companies and customers.

IV. Global Sourcing and the Software Industry

The evolution of global production networks has been well documented in the academic literature. Much of the research through 2000 focused on the role of foreign outsourcing and of offshore affiliate enterprises in the manufacturing process. More recently, attention has focused on the offshore production of services. Bardhan et al. (2004), in a case study of the computer cluster, find that at one extreme, sectors such as semiconductors have a history of globalization and outsourcing more than two decades old, while at the other extreme, the early 2000s have seen a growing surge in outsourcing in business services that were primarily home-based as recently as the mid and late 1990s. Foreign outsourcing and offshoring of computer services and software occupies an intermediate niche in this chronology, with activity starting off in the 1980s and picking up momentum through the 1990s.

Outsourcing as an Integral Part of Software Production

In the USA, there is a growing tendency of firms toward a buy—rather than build—approach to software development, reflecting the earlier process of globalization in manufacturing, as well as cost reduction imperatives. Purchasing software modules implies fewer in-house programmers, with less administrative, legal, regulatory and other headaches. Standardized and advanced software development techniques, vastly increased global bandwidth, and satellite communications make possible 24-hour continuous, globalized software development. Multilateral, coordinated development of software is now possible, with pieces of development or integration projects conducted in India or China, and with the higher value-added segments completed in the USA, again a process which has been going on in manufacturing for a while. As Steve Andriole, an MIS professor at Villanova University notes: “If you buy the argument that a lot of IT has become commoditized, [then] we are becoming inventors, creators, integrators and architects, and we are going to send the production offshore” (Computerworld, 28 April 2003). For software and services firms, outsourcing may also be a production-to-market approach, where overseas offices provide

13 Globalization stages are discussed in more detail in Kroll et al. (1998) and Bardhan et al. (2004). The book also includes an extensive discussion of various channels and stages of outsourcing in high-tech manufacturing, as well as its impact on labor inequality and firm profits.
14 See, for example, the December 2000 issue of Industry and Innovation, which was devoted to this topic.
15 See Bardhan and Kroll (2003) on this new wave of business process outsourcing.
customized programming, services or technical support to clients located in the proximity of those offices (Kroll, 2004).

**Global Locations of Foreign Outsourcing Centers**

Demand from major US corporations for foreign outsourcing centers has transformed the software sector in other parts of the globe. The past half-decade has seen the development of production centers similar to the hardware clusters found in Taiwan and Singapore, but specialized in software production and information technology services. India has dominated this trend, although Russia and China are potentially major participants. More specialized and high-end software outsourcing goes to Ireland and Israel. South Africa and Asian locations where hardware is manufactured, such as Singapore, the Philippines and Malaysia, are also poised to play a significant role in this global activity.

From the perspective of the country providing outsourcing services, several different models of offshore outsourcing may exist. In each of the following model descriptions, the *foreign firm* is the firm purchasing the outsourced services; the *domestic firm* is the firm producing the services:

A. Branch or affiliate of a foreign firm (e.g. a US multinational enterprise), located in the nation providing the outsourcing services (e.g. India, Russia).
B. Independent locally owned business contracting directly with foreign (US) firm.
C. Partnership arrangements or joint ventures between foreign and domestic firms for specific development or production goals.
D. Partnership arrangements or joint ventures between foreign firms and domestic research institutions.

In each of the above arrangements, the local unit could be an independent applications developer, a software-input supplier or an R&D center.

**V. The Evolution of the Russian Software Sector**

Table 2 shows the history of the Russian software industry in parallel with the development of the industry in the USA, Western Europe, Japan and India. In the immediate post-World War II decades, as with some other segments of the arms race, Soviet computer technology was not far behind the developments in the USA. However, the lack of horizontal ties between developers and commercial enterprises, the absence of a national market in intellectual property and of incentives for innovation meant that basic advances were not translated into commercial success and diffused through the economy. In a best case scenario, innovations might be implemented within a particular vertical interactive structure of a single ministry or enterprise, thereby missing out on the potential benefits of economies of scale associated with supplying standard software to a broader market (see Katkalo and Mowery, 1996).

**A State-Directed Industry**

The spillover effects generated in the USA from the introduction of military-initiated technological advances into the civil arena were largely absent in the USSR, in spite of the
Table 2. International comparison of evolution of software industry

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<th>USA</th>
<th>Western Europe</th>
<th>Japan</th>
<th>India</th>
<th>Russia</th>
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<tr>
<td>1940s and 1950s</td>
<td>Military funding of computer development;</td>
<td>UK develops strong university computer science programs; military role in code-breaking</td>
<td>Government funded development of computer industry; firm involvement only from large state users</td>
<td>Establishing independence and basic government institutions; first institute of technology established</td>
<td>Military programs for computer design.</td>
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<td>university and commercial involvement</td>
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<td>No commercial involvement</td>
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<tr>
<td>1960s and 1970s</td>
<td>Mainframe and minicomputer environment,</td>
<td>Security demands of code-breaking limits transfers to UK commercial sector; Germany—university role, France—military role</td>
<td>Complex custom software for large industrial users; lack of standard hardware limits opportunities for independent firms</td>
<td>Economic policies to encourage computer and software production on-shore in India but in an environment of import substitution</td>
<td>Much computer hardware based on copies of Western designs, software for central planning and military</td>
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<td>software from hardware producers, users, service companies, independent providers</td>
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<td>1980s</td>
<td>PCs and workstations introduced, role of independent software providers expanding, hardware producers rely more on independent vendors, producing packaged programs</td>
<td>National policies aimed at IT, including software. By mid-1980s, evolved to European regional policies for IT. Main success in custom and services rather than packaged software</td>
<td>Heavy investment by banking sector in computer software; also leading role in entertainment software</td>
<td>Computer Policy of 1984; Software Development Promotion Agency; connections through technical diaspora with USA; development of software outsourcing</td>
<td>Strategic choice to stay with large computer centers, PC adoption very slow, greater role of Academy of Sciences, research and academic institutes, custom or agency software</td>
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**Table 2. Continued**

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<th>Year</th>
<th>USA</th>
<th>Western Europe</th>
<th>Japan</th>
<th>India</th>
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<tr>
<td>1990s</td>
<td>WWW, Internet expand software demand, increased role of networking companies in software development</td>
<td>Interfirm and international networks of innovation, development of new technologies; major firms catering to telecom and Internet boom</td>
<td>Hardware companies and user spinoff firms continue to dominate software market over independent software providers</td>
<td>Specializing in the export of custom software, generally at low end of value chain; boom through outsourced Y2K work; large numbers of new firms competing for ever growing software outsourcing market, primarily USA</td>
<td>Greater penetration of PCs into domestic market, software cooperatives, nongovt. enterprises, joint ventures and contracts with Western firms; R&amp;D offshoring model initiated</td>
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<td>2000 on</td>
<td>Increasing physical separation, international specialization of programming work; outsourcing of internal firm operations</td>
<td>High telecom/Internet penetration leads to large local markets for custom software; Ireland maintains major role in software production</td>
<td>Some participation in offshoring of software development; emerging tech ties with China; market largely domestic except for entertainment software</td>
<td>Movement up the software value chain; IT Enabled Services Offshoring takes off amid questions raised of role and opportunities in domestic market</td>
<td>Critical mass emerging of private companies providing outsourcing services to Western firms; high end R&amp;D offshoring</td>
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Source: Authors, drawing on Mowery (1996).
widely recognized ideological importance of computing to the requirements of a planned
economy. By the 1960s and 1970s, Soviet software was largely modeled on US or Western
European designs, with a smattering of indigenous development, and with a narrow user
focus on central planning and military needs. At this time, most Western European countries
had software development efforts of their own but had not seen a major expansion into
commercial areas. Japanese software development continued to be developed through
government and large firm cooperative efforts, and India first began exploring opportunities
for shifting from software imports to on-shore development.

With the introduction of the personal computer in the 1980s, software development in
the USA diverged from that of other players. Increasing penetration of PCs and
workstations among consumers and businesses provided a market for packaged products
from independent software producers. European countries developed strong custom
software and services firms, with the help of national and regional IT policies. Japanese
producers developed strength in selected niches such as banking and entertainment. India
began extensive support of an export-oriented software industry through educational
institutions and communications improvements, and the software offshoring model was
developed. Of the major players, Russia continued to lean most heavily on large centralized
systems, with innovative activities confined to selected research institutes and ministries.

Market Reforms and the Russian Software Industry

By the time market-oriented reforms were introduced in Russia, there were large numbers
of relatively fragmented and isolated programmers, computer scientists and engineers in
scientific and production associations, research institutes, universities and enterprises
affiliated to the military–industrial–space complex. Reforms in the early 1990s led to the
restructuring of many state-owned enterprises, the establishment of joint ventures with
foreign partners, and independent private firms. Lacking either a well-established network of
private producers or a successful history of government/private sector support and
cooperation, most of the Russian software firms that emerged in the 1990s focused either
on custom software services for large organizations in the domestic market, for example, in
the banking and energy sectors, or on export markets.

A variety of different relationships have allowed Russian software firms to access US
and other foreign markets. These are described below with examples, and illustrated for the
USA, in Figure 3.

(1) Western firm R&D centers located in Russia. Major Western firms active in computer-
related sectors were among the first to recognize Russia’s untapped human capital. Some,
including Sun Microsystems, IBM and Intel, set up R&D centers in Russia, employing high-
level programmers. A major milestone was reached in 2004, when Intel purchased two
leading technology firms, including Elbrus, which was involved in advanced microprocessor
design, and UniPro, which develops utilities or the “intermediate inputs” of software.
Another early and growing form of collaboration has involved contract research between
firms set up by Russian scientific-research institutes and European or US firms.

(2) Partnerships between Russian firms or research institutes, and Western firms. Some
US firms have also branched out into partnerships and joint ventures, rather than relying on
setting up their own R&D subsidiaries. Dell computer, for example, established a Software

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Engineering Center in Moscow by drawing on production facilities and labor supplied by an independent Russian consulting firm (Robb, 2002). Some Russian research institutes and even university academic departments have partnered directly with US firms for software production.

(3) Independent firms linked through “front offices” and trade organiza. Independent, mid-sized Russian software firms have established front offices in the USA to identify customers and provide on-site management of programming assignments. The merger of Fort Ross Consortium, a cooperative venture of major software development companies and universities in St Petersburg with the National Software Development Association (also known as Silicon Taiga) in May 2004 has brought together a sizeable and significant number of software firms and technical personnel (www.russoft.org). Some other quasi-organizations, such as Outsourcing-Russia.com, which is actually a non-profit web portal and information clearinghouse, act as a link between Russian firms and potential US clients by providing information on the Russian software sector, educating Russian and foreign firms on the opportunities involved in outsourcing to Russia.

(4) The diaspora—links between Russian immigrants in the USA and Russian software developers. A specialized case of the links described under (3) above occurs through Russian immigrants, who combine knowledge of Western business needs with access to a lower cost network of Russian programmers. Genesys Telecommunications, for example, was a Silicon Valley company (now a division of Alcatel) established in 1990 by two Russian immigrants. Most of the technical workforce was foreign, primarily from Eastern Europe and Russia. Among other advantages, using immigrants is also seen as a way of overcoming the high turnover rates found in Silicon Valley (McCormack, 1998).16

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16 The two founders later went on to form Exigen, which provides business process solutions, including helping businesses outsource to the best locations (see their web site: http://www.exigengroup.com/oad/overview/).
In order to understand how the Russian firms operate and their challenges in entering a global competitive market, the authors carried out a survey of 48 Russian firms between 1 August and 30 November 2002, and conducted interviews with key figures in the industry. The firms vary widely in terms of size, ranging from a low of 20 employees to a high of under a thousand. The firms were selected from lists generated by Internet searches and from communiqués issued and conferences organized by BISNIS, the US Department of Commerce initiative. Most of the firms chosen belong to the emerging software agglomerations in St Petersburg, Moscow and Akademgorodok/Novosibirsk; quite a few have offices/representatives in the USA. The activities of these firms involved developing software utilities for Western customers, custom software, applications development, as well as other software-related activities. Questions focused on firm perceptions of strengths and obstacles, future prospects and potential barriers.

The firms that responded to the survey were private companies, either in sole ownership or, more generally, in some type of joint stock or partnership arrangement, as shown in Table 3. Many of the Russian firms now breaking into the outsourcing market are young (median age 7 years), but more than one-fourth had been in business for at least 15 years. For comparison, in a 2002 analysis of California software firms, the median age of firms was 17 years (Bardhan et al., 2003). Our survey captured the independent private firms, and did not focus on the alternative arrangements described above, such as Russian subsidiaries of major Western corporations.

As expected, outsourcing has been a critical factor in the growth of the sector. Our respondents indicated that more than 50 percent of their output is exported to the USA or Europe. This is consistent with findings from a survey conducted by Outsourcing-Russia.com (2003), in which 21 of the 31 respondent companies reported the USA and Canada as their key market. Western European countries had the next largest share, with very little exported to Asian countries.

The survey sample had a high share of firms with some type of US linkage. The survey results, then, may discount the importance of the domestic market to the Russian software industry. Follow-up interviews, as well as comments of leading observers of the Russian IT sector indicate that the domestic Russian market is increasingly a significant option for the local software sector.

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**Table 3. Organizational structure of firms (percent of respondents)**

<table>
<thead>
<tr>
<th>Type of Firm</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly traded</td>
<td>0</td>
</tr>
<tr>
<td>Privately held joint stock</td>
<td>75</td>
</tr>
<tr>
<td>Partnership</td>
<td>5</td>
</tr>
<tr>
<td>Sole proprietorship</td>
<td>20</td>
</tr>
<tr>
<td>Joint venture</td>
<td>0</td>
</tr>
</tbody>
</table>

*Source: Firm survey conducted by authors, 2002.*

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17 In the responses, it was not always clear how many of the “employees” in larger firms are programmers contracted only for specific projects.

The specialized character of the Russian software sector is evident in the education and training profiles of the labor force in these firms. The workforce is highly educated, with more than half the employees holding masters or doctoral degrees. This contrasts significantly with the Indian IT labor force, where the large majority of workers have bachelor level degrees or a non-academic technical certificate, as shown in Table 4.\(^{19}\) Many of the staff in the Russian firms had previous experience in Russian research institutions or state enterprises, although already firms appear to be able to recruit from the fledgling private sector, as shown in Table 5.

The Russian firms reported relying primarily on private firm-to-firm business contacts for most of their international business development, as shown in Table 6. Contacts with

| Table 4. Education levels of employees (with rough equivalence in degrees, percent of total employees) |
|---------------------------------------------------|--------|--------|
| **Russia** | **India** |
| Bachelor of Technology | 11.1 | 42.9 |
| Master of Technology | 49.5 | 7.2 |
| PhD | 8.5 | 0.7 |
| MBA | 1.0 | 5.2 |
| Other technical | 22.3 | 35.3 |
| Other | 7.6 | 8.7 |

*Source: Firm survey conducted by authors, 2002.*

19 Our survey data have been juxtaposed with similar data for Indian firms, obtained from Dossani (2002), as well as various reports of Nasscom, the apex Indian industry body for the software industry. (Note: The percentage figures may not add up to 100, or may exceed 100, due to some missing responses, as well as multiple choices.)
Russians living abroad were important to about one-third of the firms. Many of these firms have offices in California, Massachusetts, New York, Washington and other states, at least partially staffed with Russian expatriates. Only one firm reported business contacts made through US government agencies, and none reported using any Russian government programs for business development.

The senior executives at these firms identified a number of factors that currently constrain development of the software outsourcing industry. In descending order of importance they were: lack of an institutional support structure; underdeveloped business culture and entrepreneurial spirit; lack of financing; inadequate infrastructure; and language barriers. Despite these limitations, the software executives expressed confidence that Russian firms could compete with firms in other major countries involved in outsourcing and/or exporting software. They cited math and science training, research institutes and the level of telecommunications infrastructure as key strengths that would allow Russia to occupy a high value-added niche in the software market. In their view, low wages and the easy availability of labor, rather than a network of research institutes or a culture of science and technology, make countries such as India and China competitive with Russia today.

**Issues Going Forward**

Although richly endowed with human capital and other resources and factors, until now Russia has not been able to capture a significant share of the global software market. The experience of the Russian economy as a whole, and not just the software sector, brings home the point that while many purely “economic” factors, such as liberalization and privatization, might be a necessary condition, they are not sufficient for development. Insights on development issues from a number of disciplines suggest that institutional, governance and regulatory factors play a significant role in a nation’s growth path. Although some of the “necessary conditions” for future growth of the software sector exist in Russia, many more are still in their infancy, such as a culture of rule-of-law that respects contractual arrangements and protects intellectual property rights, a managerial class capable of risk-taking, a culture of innovation, institutions of venture capital, and joint public–private organizations for promotion of the sector. If one were to look at the prospects of the Russian software industry as it exists today through a Porterian prism, then only the cluster and factor conditions are being met. Domestic market size and firm competition conditions are far from being achieved. Moreover, it is not clear how the present state of the Russian software industry can be analyzed fully in terms of the Porter paradigm. The Porter perspective on demand factors ignores their endogenous nature, and that the quality of demand conditions is also dependent on non-economic institutional factors. It tends to underplay the role of state-led institutions in an environment of transition. Only state structures and regulations can perhaps level the economic field, inject credibility into market structures, bring a sense of stability and commonly held purpose to the entrepreneurial classes and promote a belief in a fair social contract that can then give rise to the other factors mentioned above.

**VI. Comparison of Russian and Indian Software Industries**

A comparison of Russia with India helps to highlight the industry’s current strengths and weaknesses and future potential in the global market. These are summarized in Table 7,
### Table 7. SWOT analysis: Russia, India and software outsourcing

<table>
<thead>
<tr>
<th>Factors</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
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</thead>
<tbody>
<tr>
<td>Education and skills</td>
<td><strong>Russia:</strong> Highly trained mathematicians and scientists; good educational infrastructure for science and engineering; network of research establishments; low relative costs</td>
<td><strong>Russia:</strong> Lack of training in business/entrepreneurship; potential decrease in state support; language barriers</td>
<td><strong>Russia:</strong> Partnerships with Western international institutions to augment business training; presence of Western firms increasing business expertise/experience</td>
<td><strong>Russia:</strong> Lower budget outlays and waning student interest could lead to dilution of education in mathematics and sciences; serious brain drain issues</td>
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<tr>
<td></td>
<td><strong>India:</strong> Excellent engineering institutes; growing network of private engineering and business schools; English primary medium of business and technical education</td>
<td><strong>India:</strong> Elite education system, not universal; wide range in quality</td>
<td><strong>India:</strong> Recognition of deficiencies in education leading to major initiatives, both public, private and non-profit</td>
<td><strong>India:</strong> Graduate supply bottleneck leading to potential shortages in absence of universal education; also leading to rapid wage increase in chosen occupations</td>
</tr>
<tr>
<td>Reputation and credibility</td>
<td><strong>Russia:</strong> Reputation of education system and academic and research institutions. Beginning utilization of certification for reputation build-up in industry</td>
<td><strong>Russia:</strong> Lack of reliable institutional and legal protections makes a firm's track record extremely important</td>
<td><strong>Russia:</strong> Expanded use of certifications can bridge the reputation gap temporarily until track records have been established</td>
<td><strong>Russia:</strong> Concerns with long-term viability of institutional reforms, politico-economic scenario undermines ongoing efforts to build credibility</td>
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<td></td>
<td><strong>India:</strong> Recognition of deficiencies in education leading to major initiatives, both public, private and non-profit</td>
<td><strong>India:</strong> Little depth in educational system underscores weakness in long-term credibility</td>
<td><strong>India:</strong> Can build on industry-wide reputation; newer entrants face lower barriers in global marketplace</td>
<td><strong>India:</strong> Concerns with infrastructure, trained labor force supply exhaustion could undermine credibility</td>
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<td>Factors</td>
<td>Strengths</td>
<td>Weaknesses</td>
<td>Opportunities</td>
<td>Threats</td>
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</tr>
<tr>
<td>Geographic location/markets</td>
<td><strong>Russia:</strong> Proximity to Western Europe and former Soviet block countries; distance from USA offers some 24-hour capability</td>
<td><strong>Russia:</strong> Lengthy expensive trip from the USA. Twenty-four-hour capabilities may not be as important in niches where Russian software developers excel</td>
<td><strong>Russia:</strong> Potential to expand software and services to domestic market</td>
<td><strong>Russia:</strong> US and European firms have a head start in the Russian domestic market</td>
</tr>
<tr>
<td></td>
<td><strong>India:</strong> Distance from USA offers 24-hour capability</td>
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<td></td>
<td></td>
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<tr>
<td>Government support structure</td>
<td><strong>Russia:</strong> Still functioning defense–aerospace complex; Ministry of Industry, Science and Technology as the nodal agency</td>
<td><strong>Russia:</strong> Inertia in government institutions from previous system; inefficiency and corruption in bureaucracy</td>
<td><strong>Russia:</strong> Opportunities to forge relationship between public and private sectors, between research establishments and private firms</td>
<td><strong>Russia:</strong> Lack of funding; some confusion regarding political and administrative will; overall serious threat to the continuity and viability of the scientific establishment in absence of major policy effort; some uncertainty in political environment</td>
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<tr>
<td>Factors</td>
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<tr>
<td><strong>India:</strong> Decentralized govt. support at state/local levels; special incentives and tech. parks</td>
<td><strong>India:</strong> Uneasy juxtaposition of govt./public and private sector in a time of accelerating reforms; inefficiency and corruption</td>
<td><strong>India:</strong> Example of China and needs of infrastructure development among other issues are promoting potential of cooperation between government and private sector</td>
<td><strong>India:</strong> Pressing needs of other sectors, regional disparities, inequalities and some political uncertainty might undercut support for sector</td>
<td></td>
</tr>
<tr>
<td><strong>Russia:</strong> Recent merger of trade/industry organizations; realization of importance of finance, including venture capital, intellectual property and copyright protections</td>
<td><strong>Russia:</strong> All institutions relatively weak, new, inexperienced; implementation in fits and starts</td>
<td><strong>Russia:</strong> Opportunities for trade organization to tap the latent talent, to mediate and promote partnerships with research institutes, universities, foreign companies; leapfrogging opportunity to learn from India, China</td>
<td><strong>Russia:</strong> Competitive threat from many directions, including other East European countries whose institutions are more integrated with Western Europe</td>
<td></td>
</tr>
<tr>
<td><strong>India:</strong> Well-developed trade organization with global profile; growing VC; globally well-integrated financial institutions and legal structure compatible with the West; strong entrepreneurial skills</td>
<td><strong>India:</strong> Sense of complacency on institutional development; weak corporate governance in overall corporate sector; severely inadequate physical infrastructure</td>
<td><strong>India:</strong> Critical mass reached for synergy between institutional, entrepreneurial and technical resources</td>
<td><strong>India:</strong> Gridlock in institutional development and governance; backlog of legal cases; general profile of sector “outward” looking to detriment of domestic market and poses long-term development issues</td>
<td></td>
</tr>
<tr>
<td>Factors</td>
<td>Strengths</td>
<td>Weaknesses</td>
<td>Opportunities</td>
<td>Threats</td>
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<tr>
<td>Outsourcing model</td>
<td><strong>Russia:</strong> The R&amp;D and research institute model leading to growing recognition of quality of Russian scientific talent</td>
<td><strong>Russia:</strong> Paucity of large, global, publicly traded firms; low business formation rate</td>
<td><strong>Russia:</strong> Opportunities in increasing R&amp;D offshoring trend; high value niche and opportunities for European market</td>
<td><strong>Russia:</strong> Competition from others in high value niche, especially India and China, but also other Eastern European, other Asian nations</td>
</tr>
<tr>
<td></td>
<td><strong>India:</strong> Well diversified across the value chain, as well as firm size, experience</td>
<td><strong>India:</strong> Heavy linkages with one or two regions globally; not as diversified geographically</td>
<td><strong>India:</strong> The maturity of the model presents opportunity to launch global software offensive, joint ventures in China, Russia, etc.</td>
<td><strong>India:</strong> Sustainability will depend on spillover effects generated domestically through expansion of home market, as yet not substantial in size</td>
</tr>
<tr>
<td>Diaspora linkages</td>
<td><strong>Russia:</strong> Highly educated diaspora settled in countries with advanced software capability</td>
<td><strong>Russia:</strong> Diaspora connections with home country still weak for various reasons</td>
<td><strong>Russia:</strong> Opportunities for triangulating the diaspora contacts between Russia, Israel and USA</td>
<td><strong>Russia:</strong> Security concerns making international education, immigration, business exchange visas, etc. more difficult; if not nurtured diaspora ties to country of origin tend to dissipate quickly</td>
</tr>
<tr>
<td></td>
<td><strong>India:</strong> Diaspora in Silicon Valley played critical role in developments in 1980s and 1990s; well established now in VC and other institutional circles; good contacts with country of origin</td>
<td><strong>India:</strong> The distance to India does tend to somewhat mitigate the diaspora linkage benefits, however marginally; diaspora in countries such as S. Africa etc. not yet integrated</td>
<td><strong>India:</strong> Well poised to take advantage of any potential “next big thing” with presence in the innovational infrastructure of Silicon Valley and the back-offices and labs of India</td>
<td><strong>India:</strong> Transnational immigrant networks of other groups, including Chinese equally active; increasing opportunities in India may impact future build-up of diaspora linkages</td>
</tr>
</tbody>
</table>

Source: Authors.
which is organized according to the SWOT framework. We build our analysis around a number of factors that have led to the emergence and growth of India's successful software industry.

*An Educated and Trained Labor Force*

India has had a deliberate government policy to provide a well-trained labor force in engineering and software programming. As shown in earlier tables, India graduates students in natural sciences and engineering at levels close to China and Russia. Moreover, many Indian students are educated and trained in the USA—for example, over 50,000 Indian students received visas for US study in 2003, about 8 percent of all foreign student visas (USCIS, 2005).

In terms of education and experience with complex software development tasks, Russian programmers likely outrank all others. Far fewer Russian software engineers are US or Western trained (Russians accounted for less than 1 percent of US student visas in 2003), and English and foreign language skills are somewhat limited, although significant strides have been made.

In terms of possible labor force expansion, Russia still has a large surplus of underemployed scientists and engineers, while India may be reaching a plateau in the numbers of engineers its institutes can produce. Going forward, both countries face challenges in maintaining the skilled labor base that has made the current level of activity possible.

*Reputation and Credibility*

Credible reputation building is critical in this service-oriented business (Banerjee and Duflo, 2000). Reputation is built primarily with time, experience and repeated customer satisfaction, but independent certification, particularly for relatively young firms, such as the ISO and the Capability Maturity Model (CMM) standards are an effective benchmark for new customers.

Reputation building for the labor force has been a successful strategy for India's software industry, with Indian firms advertising high levels of CMM and ISO certification. Russian firms contracting with US and European customers are emulating this approach. Of the 31 firms surveyed by Outsourcing-Russia.com, 35 percent were certified under at least one of CMM/ISO standards, and an additional 55 percent were planning to obtain one or both of these certifications (Outsourcing-Russia.com, 2003).

*Geographic Location and Market Access*

Indian IT firms have turned locations half a world away from US markets into an advantage, using the time difference to offer 24-hour turnaround capability to US firms. Russia's proximity to Europe, as well as Asia, and the increasing penetration of computers in the domestic market offer two areas of opportunity.

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20 CMM is the Capability Maturity Model, based on US standards, while ISO is a similar European certification.
Role of the State: Government Support Structure

India’s early state-directed efforts to create an indigenous computer and software industry were relatively unsuccessful. Policy changes beginning in the 1970s began to shift India towards a focus on software exports (Correa, 1996). Further policy revisions were added in the mid-1980s, with programs ranging from trade liberalization policies to software technology parks provided with the infrastructure to allow offshore software production for foreign customers (Parthasarathy, 2004). In addition, strong government support underlying the country’s public higher education institutions, such as the Indian Institutes of Technology and the Regional Colleges of Engineering, has provided the labor force that is the backbone to the software export industry.

In Russia’s transition to a market-oriented economy, the government has started withdrawing from the education sphere and has been slow to provide the necessary institutional support and legal structure for intellectual property rights protection or the infrastructure for a strong software sector.

Private, Institutional and Other Infrastructure

In India, trade organizations, private sector technical colleges and public–private partnerships have coordinated with public sector efforts to provide educational, institutional and physical infrastructure. The coordination, promotion and lobbying activity of an industry organization is exemplified by India’s major trade organization for the IT industry, Nasscom (http://www.nasscom.org). The latter lobbies for tax concessions, serves as a coordinator for the industry at large and markets the industry globally.

Russia also has active trade organizations, but without the same level of consolidation, dynamism or influence. The emergence of Russoft is an opportunity to increase the effectiveness in supporting and promoting the industry. With coordinated efforts, Russia could better address critical issues, such as finance (including venture capital) and intellectual property and copyright protections.

Existing Outsourcing Model Characteristics

Russia’s R&D, research institute model is being built on a growing recognition of the quality of Russian scientific talent. Opportunities lie mainly in increasing the R&D role and in high value-added activities in the USA and Europe.

India has a broad range of firms, diversified in size, experience and spread across the value chain. Firms are now beginning to take advantage of joint ventures with Chinese and Russian firms.

Linkage Opportunities Associated with the Diaspora

A major factor allowing India to take the lead in software outsourcing has been the many personal links that have developed out of US-educated Indian entrepreneurs and professionals, and from Indian immigrants to the USA (Saxenian, 1999, 2002). This has provided Indian firms access not only to a US customer base but also to the infrastructure of the technology industry in Silicon Valley, including venture capital
firms. The Russian software industry has yet to take advantage of these international linkages.

VII. Concluding Remarks

The Russian software industry is founded on a solid base of a highly educated labor force, a generous supply of technical workers, an established network of research facilities, and an education system that continues to produce more science and engineering graduates than any other country except the USA. Wage levels in Russia are comparable to India and Eastern Europe, and are much lower than similarly trained workers in the USA or Western Europe. Foreign firms, especially from the USA, have taken advantage of these resources to purchase high-end, high value-added software from Russian institutes and firms, but the Russian software industry is still a small player on the world stage.

The unrealized potential of Russia’s huge pool of scientists and engineers over the years seems to suggest that having a comparative advantage, or even competitive advantage more broadly defined is not enough. In addition to a number of institutional structures, public–private arrangements and other prerequisites mentioned earlier, competitiveness needs to be asserted aggressively, at the firm, industry and national levels, nurtured consciously and revealed to the global market at large. “Marketing” is an informational requirement for economic development. It is necessary both to recognize one’s comparative advantage as well as to make potential clients aware of it. Information networks, personal ties, promotion of sound business relationship require constant contact and marketing savvy. The objective of garnering a significant share in niche markets, requires a coordinated strategy, analysis of competition, market research, personnel training and development of new markets, such as in Asia.

The establishment of a supportive institutional structure that is conducive to the growth of this industry is another essential requirement. The venture capital industry, for example, has been a critical component of success in countries like India where the software sector has flourished. Reforms in tax, customs and banking laws and regulations are needed to spur its growth in Russia, as well as to encourage investment by foreign firms. Other roles for the institutional structure include facilitating marketing and promotional activity, introduction and implementation of modern quality management practices, and the development of IT infrastructure through building of techno-parks, such as the one being planned in Dubna, a nuclear science research city near Moscow.

The existing level of IT resources in Russia currently pushes the software sector toward outsourcing rather than a broader development catering to domestic markets. The Indian example should serve as a warning. Technological excellence in one sector of the economy is difficult to maintain, when related or complementary sectors are weak, and islands of world-class industry tend to drown if surrounded by mediocre industry.

Schware (1992), in a study of the contrasting software development models of Brazil (more domestic oriented) and India (export oriented), suggests that “… countries need to pay more attention to domestic opportunities, since these have high returns in terms of gaining experience and innovation in software production, and provide training that allows a broadening of software exports”. Information technology because of its very nature requires rapid dissemination to be effective, and hence the importance of a large domestic market. IT is an input into practically every industry and sector. The potential size of the domestic
market is therefore both an incentive as well as a prerequisite for rapid growth on a sustained basis. Excessive reliance by Russian software firms on foreign outsourcing business can blunt innovation and cross-fertilization that rapid dissemination through various branches of domestic industry can foster.

The study of an industry that seems to possess many of the crucial factors needed for rapid growth, in a country that has followed the orthodox textbook economic consensus in managing its economy, but whose economy has yet to take off in any globally significant way, sheds some more light on emerging sectors in developing and transitioning economies.

A Review of Some Theory and a Word on Competitiveness

Theories of comparative and competitive advantage are not enough to explain the Russian software industry experience. While high value-added software development outsourcing relationships have thrived in Russia, in spite of an unreliable institutional environment and weak business structures, the industry has much greater potential that will only be realized if the underlying sources of advantage are overtly marketed, actively exploited and institutionally supported and promoted. The minimalist intervention in markets prescribed by Porter for the establishment of competitive advantage is perhaps a strategy better suited for advanced developed countries.

The neoclassical paradigm seems similarly limited. While the latter has a macro outlook and the Porterian framework a firm/industry focus, neither deals with the dynamic of a supportive institutional structure in tandem with state players. The theory of comparative advantage only serves to point economic actors in the right direction, while the Porterian framework serves up half a dish, ignoring the non-market supportive institutions, such as ones dealing with governance, rule of law and market failures. Moreover, the framework is firm-centric and its only policy prescription at the macro-level, that is, the factor conditions, or skilled labor and infrastructure, are already met in the case of Russia. The now extensive literature on Chinese economic success illustrates the importance of the role of the state and underscores the pitfalls of exaggerating the importance of the standard economic prescriptions. The success of town and village enterprises in China, not to mention that of Chinese major telecom firms, with their fuzzy property rights and the entire dual track reform path fly in the face of off-the-shelf standardized one size fits all advice to the effect that privatization of firms and liberalization of prices and markets will automatically provide growth.

Market macro-economics is very good at regulating and managing the demand side, but the supply side of an economy, or the entire range of activity embracing firm formation, the innovation chain and the facilitating regulatory mechanisms, is more institution and governance specific. Only effective state governance can inject credibility into market and institutional structures, bring a sense of stability and commonly held purpose to the entrepreneurial classes and promote a belief in a fair social contract among the general citizenry, which can then lead to the creation of healthy conditions for technical competitive factors to come to the fore.

References


